REMARKS

Claims 1-16 are amended. No new matter is introduced herein. Support for the amendments can be found in the specification, particularly on page 8, line 17, through page 9, line 12, page 15, lines 30-32, and page 17, lines 2-5 and 17-19. Claims 17-41 are cancelled. Non-elected claims are cancelled herein to place the present application in a condition for allowance (MPEP 821.02). By this Amendment, claims 1-16 are pending.

It is respectfully submitted that the amended claims 1-16 particularly point out and distinctively claim the subject matter which the applicant regards as the invention and that the amended claims 1-16 recite subject matter not reached by the applicable prior art under 35 USC §§ 102(b) and/or 103(a). It is further respectfully submitted that the present Amendment to the claims renders the objections and rejections set forth in the previous Office action moot. Nevertheless, to facilitate the examiner to forward the present application to allowance, applicant respectfully submits the following.

Regarding the Objection to the Specification

The abstract of the disclosure, amended in Amendment A, is objected to because there is no antecedent basis for "operational circuiting". However, applicant is unable to find "operational circuiting" in the amended abstract. Consequently, no amendment to the abstract is included herein and the objection to the abstract should be withdrawn.

Regarding the Objection to the Drawings

The drawings were objected to because reference number 11 shown in figures 6-9 was not described in the specification. It is respectfully submitted that the work piece in figures 6-9, to which the reference number 11 refers, is described in the specification on page 23, lines 8-14. It is the reference number 11 that was inadvertently left out in the specification. An amendment to the specification to correct the inadvertent error is included herein. Consequently, no drawing correction is necessary and the objection to the drawings should be withdrawn.

Regarding the Objection to the Claims

Claims 12-22 were objected to as being improper dependent claims. Claims 12-22 are respectively amended or cancelled herein to obviate this objection. Withdrawal of the objection to these claims is therefore earnestly requested.

Regarding 35 U.S.C. § 112, second paragraph, Rejections

Claims 5 and 23 were rejected under this provision for failing to point out and distinctly claim the subject matter which the applicant regards as his invention. It is respectfully submitted that, by amending claim 5 and canceling claim 23, the present Amendment has overcome the 35 U.S.C. § 112, second paragraph, rejections set forth in the Office action.

Regarding 35 U.S.C. § 102(b) Rejections

As submitted above, the present Amendment to the claims renders the rejections set forth in the previous Office action moot. Nonetheless, it is respectfully submitted that the cited prior art does not teach or anticipate the present invention. Furthermore, the cited prior art does not teach or anticipate each and every element recited in the amended claims 1-16.

Note original claims 1-5, 9, 11, 14-15 and 18-22 were rejected under this provision as being anticipated by Tang *et al.* (U.S. Pat. No. 5,025,346). However, there were no references cited against claims 4-5, 9, 11, 14-15 and 18-22. Tang *et al.* is said to anticipate original claims 1-3 because Tang *et al.*, in related text [col. 6, line 55, through col. 7, line 52] and figure 4I, "disclose a silicon structure 55 being positioned on a work piece 50 together with an operational circuitry 54 and being formed on top of a sacrificial layer 56." This statement is incorrect because the polysilicon layer 54 of Tang *et al.* is NOT an operational circuitry. In fact, Tang *et al.*'s patent, which teaches a laterally driven resonant microbridge device for use as a sensor or an actuator, is not considered relevant to the present invention.

Original dependent claim 10 was rejected under this provision as being anticipated by Yagi *et al.* (U.S. Pat. No. 5,658,698). Applicant respectfully reminds the examiner that dependent claim 10 is directed to a combination including everything recited in the base claim 1 and what is recited in the dependent claim 10. It is this combination that must be compared with the prior art, exactly as if it were presented as one independent claim [MPEP 608.01(n)(III)]. This rejection is therefore improper and should be withdrawn.

Regarding 35 U.S.C. § 103(a) Rejections

Claims 6-8 were rejected under this provision as being unpatentable over Tang *et al., supra,* in view of Yao (U.S. Pat. No. 5,578,976). Claims 23-24 were rejected under this provision as being patentable over Tang *et al., supra,* in view of Mitchell (U.S. Pat. No. 5,573,679). Claims 6-8 are amended herein and claims 23-24 are cancelled herein, rendering the rejections moot.

Regarding the Present Amendment and Cited Prior Art

This Amendment is not to be construed as an admission to the applicability and/or correctness of the rejections set forth in the Office action. It is however submitted that none of the cited prior art teach or suggest the present invention as set forth in the amended independent claim 1, which now recites

> A micro-machined structure comprising:
> a structural layer consisting essentially of sputtered silicon, said structural layer comprising a core silicon layer; and
> a pre-fabricated integrated electronic circuitry electrically coupled to said structural layer, said pre-fabricated integrated electronic circuitry is characterized as an operational semiconductor circuitry.

As a whole, Tang *et al.* do not anticipate or suggest claim 1 at least because the polysilicon layer 54, which must withstand high deposition temperature, is not an operational semiconductor circuitry. At best, the polysilicon layer 54 serves as an electrode plane. As one skilled in the art would have readily recognized, high temperature kills electronic circuits, although not necessarily electrodes. Tang *et al.* do not teach or suggest lower deposition temperature. Thus, without knowing how to solve the high deposition temperature problem, one skilled in the art would not have been able or motivated to substitute or modify Tang *et al.*'s electrode plane so that the microstructure is integrated with an operational semiconductor circuitry.

Moreover, the structural layer 55 of Tang *et al.* is made of polysilicon deposited by LPCVD at 605°C [col. 7, lines 14-15]. Contrastingly, the structural layer of the present invention consists essentially of sputtered silicon. Sputtered silicon was NOT a common material of microstructures at the time of the invention. As discussed in the present application

and in the general knowledge of one skilled in the art at the time of the invention, polysilicon has been the material of choice due to its excellent mechanical properties and controllable stress [Spec. page 2, lines 3-5]. What is more, stress control in sputtered silicon structures has only been previously demonstrated with high temperature that would have killed an operational semiconductor circuitry [Spec. page 3, lines 9-25]. In view of the foregoing, at the time of the invention, it would NOT have been obvious to one skilled in the art and one skilled in the art would not have been motivated to modify Tang *et al.* to make a micro-machined structure comprising a structural layer consisting essentially of sputtered silicon.

As a whole, Yagi *et al.* also do not anticipate or suggest claim 1. Figure 4K and 10L of Yagi *et al.* show a microstructure comprising electrode plates **14/16** being position on a silicon substrate **1** together with a beam/bridge member **2** and a supporting structure **3**. The electrode plates **14/16** are made of chromium (Cr), the bridge member **2** is made of crystalline silicon, and the supporting structure **3** is made of sputtered aluminum. Yagi *et al.* do not teach a micro-machined structure comprising a structural layer consisting essentially of sputtered silicon and an operational semiconductor circuitry electrically coupled to the structural layer.

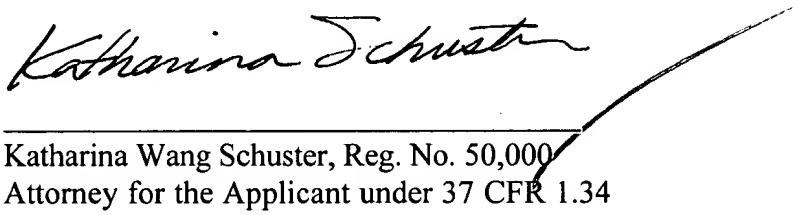
The question is whether, at the time of the invention, it would have been obvious to one skilled in the art to modify Yagi *et al.* so to arrive at the invention as claimed. Because Yagi *et al.* teach away from the claimed invention, Applicant respectfully submits that it would not. First, Yagi *et al.* specifically teach using adhesive material, i.e., pre-formed layers bonded together by adhesion, to avoid high temperature damage to the substrate **1** [col. 5, lines 4-50]. Second, Yagi *et al.* specifically choose crystalline silicon, a non-conformal material unlike sputtered silicon, to avoid internal stress [col. 8, lines 55-59].

Conclusion

For the foregoing reasons, it is respectfully submitted that the amended independent claim 1 recites subject matter not reached by application prior art of record under 35 U.S.C. §§ 102 and/or 103 and therefore should be allowed. Reliance is placed on *In re* Fine, 5 USPQ 2d 1596, 1600 (Fed. Cir. 1988) and *Ex parte* Kochan, 131 USPQ 204 (Bd. App. 1960) for the allowance of dependent claims 2-16, since they differ only in scopes from the base claim 1 which is submitted to be patentable. Accordingly, Applicant respectfully submits that the present application is in

a condition for allowance. Favorable consideration and a Notice of Allowance of all pending claims are therefore earnestly solicited. The examiner is invited to telephone the undersigned at (408) 260-7300 extension 23 for discussing an Examiner's Amendments or other suggested actions for accelerating prosecution and moving the present application to allowance.

Respectfully submitted,



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CLEAN COPY OF THE AMENDED CLAIMS

1) (Currently amended) A micro-machined structure comprising:

a structural layer consisting essentially of sputtered silicon, said structural layer comprising a core silicon layer; and

a pre-fabricated integrated electronic circuitry electrically coupled to said structural layer, said pre-fabricated integrated electronic circuitry is characterized as an operational semiconductor circuitry.

2) (Currently amended) The micro-machined structure of claim 1, wherein said structural layer further comprises:

at least one conductive layer in contact with said core silicon layer.

3) (Currently amended) The micro-machined structure of claim 2, wherein

said at least one conductive layer is made from a Titanium based material.

4) (Currently amended) The micro-machined structure of claim 2, wherein

said at least one conductive layer is made from a material selected from a group consisting of TiW and TiN.

5) (Currently amended) The micro-machined structure of claim 2, in which said core silicon layer and said at least one conductive layer have essentially the same shape.

6) (Currently amended) The micro-machined structure of claim 2, wherein

said core silicon layer has a first dissolving characteristic and said at least one conductive layer has a second dissolving characteristic and wherein said second dissolving characteristic is compatible with said first dissolving characteristic.

7) (Currently amended) The micro-machined structure of claim 1, wherein

said operational semiconductor circuitry includes an aluminum-based metalization.

8) (Currently amended) The micro-machined structure of claim 1, wherein said operational semiconductor circuitry is a complimentary metal oxide semiconductor (CMOS) circuitry.

9) (Currently amended) The micro-machined structure of claim 1, further comprising: at least one sealing layer.

10) (Currently amended) The micro-machined structure of claim 9, wherein said at least one sealing layer consisting essentially of silicon nitride.

11) (Currently amended) The micro-machined structure of claim 1, wherein said core silicon layer is made from boron doped silicon.

12) (Currently amended) The micro-machined structure of claim 1, wherein said core silicon layer is made from silicon doped with 40-80 ppm boron.

13) (Currently amended) The micro-machined structure of claim 1, wherein said micro-machined structure is characterized as having an essentially buckling-free deformation configuration.

14) (Currently amended) The micro-machined structure of claim 1, wherein said core silicon layer has a predetermined thickness which influences a strain gradient of said micro-machined structure.

15) (Currently amended) The micro-machined structure of claim 1, wherein said structural layer further comprises:
a first conductive layer in contact with and on top of said core silicon layer; and
a second conductive layer in contact with and below said core silicon layer, wherein said first and second conductive layers have essentially the same shape as said core silicon layer.

16) (Currently amended) The micro-machined structure of claim 1, wherein said micro-machined structure is characterized as having a variable sputtered layer thickness and a correlated curvature, wherein said correlated curvature essentially decreases with an increase of the variable sputtered layer thickness.

Claims 17-41 (Cancelled).